DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 8, 9, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeConde et al. (U.S. 6,889,565; hereinafter "DeConde") in view of Berger et al. (U.S. 4,477,835; hereinafter "Berger").

Re claim 1: Deconde teaches a pressure sensor (fingerprint sensor **20** comprises an array of switches see column 3, line 7) comprising: plural first wires and plural second wires intersecting with each other in arrangement (metallic leads arranged in an MxN orthogonal grid; column 3, lines 17-21); and sensor sections provided in the vicinities of the respective corresponding intersections (each switch corresponds to an intersection of row line and column line; column 3, lines 12-13), wherein each of the sensor sections includes: a first electrode electrically connected to the first wire (lower electrode **50** is electrically connected to row lead **44**; column 6, lines 41-42); a second electrode disposed opposite to the first electrode (upper electrode **66**; column 6, lines 34-36); and a cavity formed between the first electrode and the second electrode (gap **54**; column 6, line 5).

DeConde fails to teach the first wires having larger width portions in spaces between adjacent sensor sections and narrower width portions in the vicinities of the

sensor sections and the narrower portions have outlines that are at a substantially constant spacing from outlines of the respective sensor sections.

Berger teaches electrodes or grids **3** along parallel lines L_{i-2}, L_{i-1}, L_1 that are provided with recesses **16**, substantially in the form of a circle positioned on either side of each line (column 3, lines 55-63 and figure 2). As can be seen from figure 2, recesses **16** are formed in the electrodes in the vicinity of the sensor sections therefore, narrow portions are provided in the vicinity of the sensors and larger width portions are provided in spaces between the sensors. Also, since the recesses **16** are in the form of a circle, they form a substantially constant spacing from outlines of the respective sensor sections.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of DeConde and Berger to result in a pressure sensor array having first and second leads where there are narrower width portions in the vicinities of the sensor areas and the width of the first lead has wider portions adjacent the sensor areas. The resulting device would have the benefit of being able to place the horizontal rows closer together because the electrodes will have recess portions that will allow the electrodes to not interfere with the sensor area.

Re claim 2: DeConde teaches the pressure sensor wherein the second wires work additionally as the second electrode in the sensor sections (**46**, **66**; figure 6A).

It is the Examiner's position that the recitation "the second wires work additionally as the second electrode in the sensor sections" of claim 1 is not given any patentable weight due to the recitation being an intended use of the claimed invention and does not

result in a structural difference between the claimed invention and the prior art. The column lead 46 is electrically connected to upper electrode 66 and is therefore is capable of working as "the second electrode", as recited in the claim.

Re claim 4: DeConde teaches the pressure sensor where the first wires are connected to the first electrodes at the larger width portions (lower electrode **50** is electrically connected to row lead **44**; column 6, lines 41-42 and figure 4B). As can be seen in figure 4B, electrode **50** is connected to lead **44** at a position to the lower left of the electrode. The combined teachings of DeConde and Berger where the wider width portions are provided in the areas adjacent the sensor area and would have resulted in the electrode connecting to the lead at a wider width portion.

Re claim 8: DeConde teaches the pressure sensor wherein the first wires are connected to the first electrodes through contact layers higher in resistance than the first wires (resistor strip **70** is preferably made of a high-resistivity material row lead **44** is preferably made of highly-conductive materials; column 8, lines 55-56 and 65-66 and figure 4a).

Re claim 9: DeConde teaches the pressure sensor wherein the contact layers are formed with a silicon layer mixed with a conductive impurity (resistor strip **70** is preferably made of highly resistive material such as doped silicon; column 8, lines 55-57).

Re claims 11 and 12 DeConde teaches the pressure sensor wherein the first wires are connected to the first electrodes through switching elements; and the pressure sensor wherein the switching elements are thin film transistors (a large resistive device

is preferably placed in series with each switch **40** of sensor **20** in the array such as field effect transistors, thin film transistors; column 4, lines 10-17).

Re claim 13 DeConde teaches the pressure sensor wherein a scanning signal is sequentially supplied onto the plural first wires (an electrical circuit such as a counter, shift register and operational amplifier attached to a multiplexer combined with current/voltage detectors can be used to detect the output current or voltage from the row/column being addressed; each switch can be polled individually; column 3, line 66-column 4, line 5).

Re claim 14: Berger teaches the pressure sensor wherein the narrower portions have substantially arc-shaped outlines along outlines of the first electrodes (electrodes or grids **3** along parallel lines L_{i-2}, L_{i-1}, L_1 that are provided with recesses **16**, substantially in the form of a circle positioned on either side of each line; column 3, lines 55-63 and figure 2).

3. Claims 5 and 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeConde modified by Berger as applied to claim 1 above and further in view of Tamori (US 5,526,701). The teaching of DeConde modified by Berger has been discussed above.

However, DeConde modified by Berger fails to specifically teach all of the first wires and all of the second wires extend outwardly from the outermost peripheral boundary portion where sensor sections along the outermost periphery are disposed.

Tamori teaches all of the first wires and all of the second wires (see figure 1 and "electrode lines 20, 30" column 4, lines 3-6) extend outwardly from the outermost peripheral boundary portion where sensor sections along the outermost periphery are disposed (see figure 1 and "electrode lines 20, 30 are gathered on edges A, B" column 4, lines 5-6).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate all the first wires and all the second wires gathered at the edges as taught by Tamori to the teachings of DeConde modified by Berger in order to produce a fingerprint reading device having all of the first and seconds wires to extend outwardly from the outermost peripheral boundary portion where the sensor section along the outermost periphery are disposed in order to allow the electrode lines gathered on the edges of the base plate to be connected to an external circuit via connectors (column 4, lines 5-7).

Further, parameters such as length and distance in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device characteristics during fabrication. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the length as claimed in the combined structure.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeConde modified by Berger as applied to claim 1 above and further in view of Jarvis et al. (US

4,539,554; hereinafter "Jarvis"). The teaching of DeConde modified by Berger has been discussed above.

However, DeConde modified by Berger fails to specifically teach dummy sensor sections are disposed in the outermost peripheral portion of a region including the sensor sections. Jarvis teaches a dummy reference cell 39 included in each column of the array, where each dummy cell is of an identical structure to transducers (see figure 3 and column 4, lines 36-41).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate a dummy reference cell in each column as taught by Jarvis to the teachings of DeConde modified by Berger in order to produce a fingerprint reading device having dummy sensor sections disposed in each column set the cell dc reference potential prior to sensing (column 4, lines 36-42).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeConde modified by Berger as applied to claim 8 above and further in view of McClure (US 5,898,235). The teachings of DeConde modified by Berger have been discussed above.

However, DeConde modified by Berger fails to specifically teach contact layers are formed with polycrystalline silicon.

McClure teaches the fabrication of a resistor in an integrated circuit device constructed in a strip of high resistivity polycrystalline silicon (see column 5, lines 25-30).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate construction of a resistor using polycrystalline silicon as taught by McClure to the teachings of DeConde modified by Berger in order to produce a fingerprint reading device having contact layers connecting first wires and first electrodes formed of polycrystalline silicon, which is commonly known to provide high resistance value (column 5, line 28).

Response to Arguments

6. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection in view of DeConde, Berger, Tamori, Jarvis and McClure as set forth in the Office action.

Conclusion

Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE Y. MIYOSHI whose telephone number is (571)270-1629. The examiner can normally be reached on M-F 7:30AM-5:00PM EST. Alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JYM

/Kimberly D Nguyen/
Supervisory Patent Examiner, Art Unit 4176
12/13/07